

Lab 1 - IP Addressing

Lab 1: Basic IP lab—IP addressing

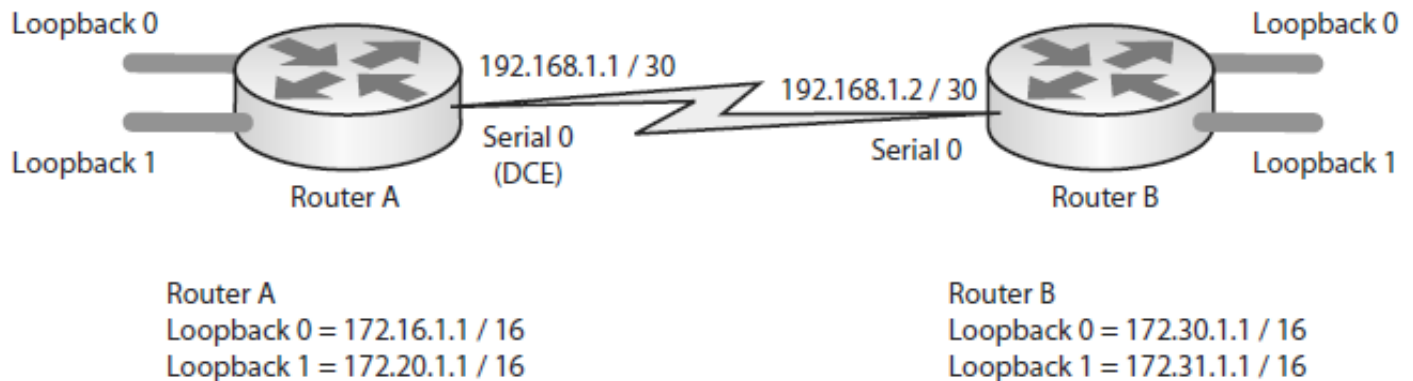


Figure 14–1: IP addressing

The physical topology is as shown in Figure 14–1.

Lab exercise

Your task is to configure the IP addressing as specified in Figure 14–1. Some of the commands we will use are discussed later, but we will enter them for practice.

Purpose

Every router will need to be configured with IP addresses and have to connect to another router either on the LAN or WAN. Being able to do this without looking at the walk-through is your eventual goal. This lab is the springboard for every other lab in the lab book.

Lab objectives

1. Configure the “enable password” to be “cisco”.
2. Set the console password to be “letmein”.
3. Configure telnet access to use the local username of “banbury” with the password “ccna”.
4. Set the IP subnets for the loopback 0 and loopback 1 interfaces.
5. Set the IP subnet for the serial 0 interface.

Lab walk-through

1. To configure the “enable password” on a router, you need to do the following:

```
Router>enable
```

```
Router#configure terminal
```

```
Router(config)#hostname RouterA
```

```
RouterA(config)#enable password cisco « Configures the “enable
```

password” or use an “enable secret password” (but not both)

RouterA(config)#enable secret cisco « **Configures a more secure**

“enable password”

2. To configure the console password, you need to configure the console port. To do this, enter the following commands (in global config mode):

RouterA(config)#line console 0

RouterA(config-line)#password letmein « **Whoever connects to the console port**

will have to enter the password “letmein”

RouterA(config-line)#login

RouterA(config-line)#exit

RouterA(config)#

3. To set telnet access, you need to configure the VTY lines to allow telnet access: to do this type (from configuration mode):

RouterA(config)#line vty 0 4 « **Enters the VTY line configuration**

RouterA(config-line)#login local « **This will use local usernames**

and passwords for telnet access

RouterA(config-line)#exit « **Exit the VTY config mode**

RouterA(config)#username banbury password ccna « **Creates username**

and password for telnet access (login local)

4. We now need to start setting the IP addresses on the loopback interfaces. As you will see from Figure 14–1, the subnet mask for the networks is represented by a /16 notation. This is actually a Class B mask (255.255.0.0)—the default for the address ranges we are using for the loopback interfaces. To apply an IP address to an interface, do the following:

RouterA(config)#interface loopback 0

RouterA(config-if)#ip address 172.16.1.1 255.255.0.0

RouterA(config-if)#interface loopback 1

RouterA(config-if)#ip address 172.20.1.1 255.255.0.0

5. Next, we need to configure the IP address for the interface serial 0. As this is a WAN link, it is good practice to conserve as many addresses as possible. So, as you will see in the network diagram in Figure 14–1, the serial interface is using a /30 mask; this is a 255.255.255.252 mask when written in dotted decimal format. By using this subnet mask, we reduce the available addresses from 255 per subnet to two available host

addresses per subnet.

If the router does not accept this mask, you may need to enter the “ip subnet-zero” command to the router in config mode. However, as you will remember from the IP

addressing/subnetting presentation we cannot use an address that is all 1s or all 0s, so

the actual usable addresses are two. This mask is perfect for a WAN link, such as the

one we are using in this lab, because no addresses are being wasted:

Module 4 labs

```
RouterA(config)#interface serial 0
```

```
RouterA(config-if)#ip address 192.168.1.1 255.255.255.252
```

```
RouterA(config-if)#clock rate 64000 « If this has the DCE cable attached
```

```
RouterA(config-if)#no shutdown « This will initialize the
```

interface from the default state of down. This is only

necessary on physical, not logical (loopback) interfaces.

The following message should appear on the console session for router A:

```
00:15:51: %LINK-3-UPDOWN: Interface Serial0, changed state to down
```

The interface will not come up until router B's serial interface is up.

6. We will now follow all the above steps for router B.

Router B:

```
Router>enable
```

```
RouterB#config t
```

```
Router(config)#hostname RouterB
```

```
RouterB(config)#enable password cisco
```

or use an “enable secret password” (but not both).

```
RouterB(config)#enable secret cisco
```

Do not use the same password for both; otherwise, you will receive a warning message. In fact, it is best practice to just use the “enable secret”:

The enable secret you have chosen is the same as your enable password.

This is not recommended. Re-enter the enable secret.

Configure the console password:

```
RouterB(config)#line console 0
RouterB(config-line)#password letmein
RouterB(config-line)#login
RouterB(config-line)#exit
RouterB(config)#
```

Configure the telnet password:

```
RouterB(config)#line vty 0 4
RouterB(config-line)#login local
RouterB(config-line)#exit
RouterB(config)#username banbury password ccna
```

Configure the loopback addresses:

```
RouterB(config)#interface loopback 0
RouterB(config-if)#ip address 172.30.1.1 255.255.0.0
RouterB(config-if)#interface loopback 1
RouterB(config-if)#ip address 172.31.1.1 255.255.0.0
```

Configure the serial addresses:

```
RouterB(config-if)#interface serial 0
RouterB(config-if)#ip address 192.168.1.2 255.255.255.252
RouterB(config-if)#no shutdown
```

7. You should see the interface come up on the console session:

```
00:31:21: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0, changed state to up
```

If router B has the DCE interface attached, then set the clock rate on that. You can issue the "show controllers serial 0" command to see if the cable is DTE or DCE.

You should now be able to ping router A from router B and vice versa.

```
RouterB#ping 192.168.1.1
```

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 192.168.1.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 32/32/32 ms

RouterB#

If pings are not working, check the serial interfaces to make sure they are both up up with the “show ip interface brief” command.

RouterA#show ip interface brief

Interface	IP-Address	OK?	Method	Status	Protocol
Ethernet0	unassigned	YES	unset	administratively down	down
Loopback0	172.16.1.1	YES	manual	up	up
Loopback1	172.20.1.1	YES	manual	up	up
Serial0	192.168.1.1	YES	manual	up	up
Serial1	unassigned	YES	unset	administratively down	down

RouterA#

Make sure you have put a clock rate on the correct interface, i.e., the DCE side. You can check with the “show controllers serial 0” command (if you are plugged into serial 0, that is).

RouterA#show controllers serial 0

HD unit 0, idb = 0x162890, driver structure at 0x168C18
buffer size 1524 HD unit 0, V.35 DCE cable, clockrate 64000
cpb = 0x2, eda = 0x2940, cda = 0x2800
RX ring with 16 entries at 0x4022800
00 bd_ptr=0x2800 pak=0x16A10C ds=0x4026108 status=80 pak_size=0

Make sure you have put the correct IP address on both sides and the subnet masks are the same.

If all else fails and you cannot find what is wrong, look at the “show run” for both routers below. The commands on by default are in bold for Router As output. You should not need to enter them unless you have an old version of Cisco IOS.

You can copy and paste the configs below into your router at the “Router(config)#” prompt. Bear in mind that your router may have different interfaces. If, for example, your serial cable is plugged into serial 1, you will have to make the necessary changes to my configurations.

The exclamation marks are there to make the reading easier when you look at the show run.

Show runs

RouterA#show run

Building configuration...

Current configuration : 709 bytes

!

version 12.1

service timestamps debug uptime

service timestamps log uptime

no service password-encryption

!

hostname RouterA

!

enable secret 5 \$1\$ruj!\$BJ8GgiK8U9p5cdfXyApPr/

!

username banbury password 0 ccna

!

in subnet-zero

```

ip subnet-zero
!
interface Loopback0
 ip address 172.16.1.1 255.255.0.0
!
interface Loopback1
 ip address 172.20.1.1 255.255.0.0
!
interface Ethernet0
 no ip address
 shutdown
!
interface Serial0
 ip address 192.168.1.1 255.255.255.252
 clockrate 64000
!
interface Serial1
 no ip address
 shutdown
!
interface BRI0
 no ip address
 shutdown

ip classless
no ip http server
!
line con 0
 password letmein
 login

line aux 0
line vty 0 4
 login local
!
end

```

RouterA#

Router B:

```

RouterB#show run
Building configuration...
Current configuration : 697 bytes
!
version 12.1
service timestamps debug uptime
service timestamps log uptime
no service password-encryption
!
hostname RouterB
!
enable secret 5 $1$ydeA$MyfRKevOckjm7w/0ornnB1
!
username banbury password 0 ccna
!
ip subnet-zero
!
interface Loopback0
 ip address 172.30.1.1 255.255.0.0
!
interface Loopback1
 ip address 172.31.1.1 255.255.0.0
!
interface Serial0
 ip address 192.168.1.2 255.255.255.252

```

```
!  
interface Serial1  
  no ip address  
  shutdown  
!  
interface Ethernet0  
  no ip address  
  shutdown  
!  
interface BRI0  
  no ip address  
  shutdown  
!  
ip classless  
no ip http server  
!  
line con 0  
  password letmein  
  login  
line aux 0  
line vty 0 4  
  login local  
!  
end
```

RouterB#



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